

ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SPK-09690
Oct 82
Revised Apr 89

TO: Architect-Engineers and District Personnel:

1. The attached revised guide specification supercedes the previous guide, CARPET TILE, SPK-9B (Air Force), dated October 1982, and is for use in the preparation of project specifications.

GENERAL NOTES

Para 2

TECHNICAL NOTES

Para C

TEXT REVISIONS

Para 1

Para 1.1

Para 1.2

Para 1.3

Para 3

Para 5.1.2.1.1

Para 5.1.2.3.2

Para 8

NOTE: A-E's should read all the TECHNICAL NOTES located at the beginning of this guide specification and edit the specification accordingly.

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GENERAL NOTES

1. This guide specification is to be used in the preparation of contract specifications in accordance with the Sacramento District Specification Manual. It will not be made a part of a contract merely by reference; pertinent portions will be copied verbatim into the contract documents.
2. Where numbers, symbols, words, phrases, clauses, or sentences in this specification are enclosed in the following manner: [], a choice or modification must be made; delete inapplicable portion(s) carefully. Where blank spaces occur in sentences, insert the appropriate data. Where entire paragraphs are not applicable, they should be deleted completely.
3. CAUTION: Coordination of this section with other sections of the specification and with the drawings is mandatory. If materials or equipment are to be furnished under this section, but installed, connected, or placed in operation under other sections of the specification and/or the drawings, then state the fact clearly and concisely in this section and in all other sections involved. EACH DISCIPLINE SHALL REVIEW THE ENTIRE SPECIFICATION TO INSURE THAT LANGUAGE IS INCLUDED TO PROVIDE COMPLETE AND OPERABLE SYSTEMS AND EQUIPMENT.
5. DO NOT INCLUDE GENERAL NOTES OR TECHNICAL NOTES IN FINAL MANUSCRIPT.

TECHNICAL NOTES

- A. The section number will be inserted in the specification heading and prefixed to each page number in project specifications.
- B. Paragraph 1: The listed designations for publications are those that were in effect when this guide specification was being prepared. These designations are updated when necessary by District Instruction, and references in project specifications need be no later than in the current District Instruction for this guide specification. To minimize the possibility of error, the letter suffixes, amendments, and dates

indicating specific issues should be retained in Paragraph 1 and omitted elsewhere in the project specification.

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- C. Paragraph 5.1.1: Using Table I, determine the carpet tile wear classification for the facility.

Insert the surface texture required (also see Technical Note D).

Using Table II, insert the pile fiber, pile weight; and density for the wear classification. A variety of commonly used pile yarn fibers are listed in Table II. Each has different performance characteristics. All are not necessarily satisfactory for all uses. Specifications for each carpet tile will usually specify the pile yarn that best meets requirements. The choice of pile yarn fiber will be governed by the prospective use of the material, and should be determined by a careful evaluation of: texture retention, soil hiding, cleanability, abrasion resistance, desired appearance, cost, and other factors applicable to the project. If, however, more than one fiber will meet project requirements equally well and there is no technical or design preference, alternate pile fibers in the appropriate weight and density for each may be permitted as a supplier's option.

FIBER PERFORMANCE CHARACTERISTICS

CHARACTERISTIC	RATING	
	GOOD	FAIR
Texture Retention	Nylon	Acrylic
Soil Hiding	Nylon	Acrylic
Cleanability	Nylon	
Abrasion Resistance	Nylon	Acrylic

Insert the pattern color required. Describe fully or give manufacturer's name and pattern and color designation for the carpet selected.

If more than one carpet tile is required, repeat the surface texture, pile fiber, pile weight, pile density, pattern and color requirement as necessary for each quality. Designate each different carpet with a

letter or number symbol. Use the symbol to key each carpet to locations listed in paragraph entitled, Location, or indicated on the drawings.

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- D. Paragraph 5.1.1.1: This paragraph defines the surface texture to be specified in paragraph entitled, Physical Requirements, and regulates physical aspects of the carpet tile pile surface to insure proper wear and appearance retention. Any surface texture may be printed or dyed to provide a pattern. A blank is provided in paragraph entitled, Physical Requirements, to specify pattern and color required.
- E. Paragraph 5.1.2.9: A maximum of 3.5 kV of static protection is satisfactory for most installations. Specify the electrical equipment manufacturer's recommendation for static protection for critical areas such as computer rooms, where excessive static build-up may create functional or safety hazards. In the absence of manufacturer's recommendation, use the 1.5 kV requirement.
- F. Paragraph 5.1.2.10: Include electrical resistance requirements in all computer room installations, and for other installations where recommended by the electronic equipment manufacturer to insure personnel safety and proper operation of the equipment. Delete the paragraph if not applicable to the project.
- G. Paragraph 5.2: Specify aluminum or vinyl molding as required. If Contractor's option of either aluminum or vinyl is acceptable, modify to permit both and specify color for both types.
- H. Paragraph 6.1: The section on Wood Doors should include requirements for undercutting bottoms of doors to allow clear door swing over carpeted areas. Coordinate this section with the section on resilient floors to insure that straight carpet-type resilient base is used in areas to receive wall-to-wall carpet tile.
- I. Paragraph 6.2: If "specified herein" is used, insert the room or area number[s] and the type of carpet tile to be used. If more than one carpet tile is to be used, list each room or area number to be carpeted and specify the carpet tile type. Coordinate with paragraph entitled, Physical Requirements.
- J. Paragraph 6.3: Replacement of carpet tile in the event of gross damage or need to destroy tile to reach subfloor utilities is integral to the carpet tile concept. Replacement carpet tile should be based on anticipated usage. In the absence of experience data, a minimum of one

carton of 20 carpet tiles is recommended and on large projects one-half of one percent of the total carpet tile installed is suggested.

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- K. Paragraph 7.2: The degree of protection of completed work required may vary, depending on the type and size of the facility, the schedule of other building trades, completion data, and move-in requirements for furniture and equipment. The paragraph should be modified as required. In any case, the last sentence should remain.

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TABLE I

CARPET WEAR CLASSIFICATION BY FACILITY TYPE

FACILITY	CARPET WEAR CLASSIFICATION		
	MODERATE	HEAVY	SEVERE
ADMINISTRATIVE FACILITIES (Including Administrative Areas in Other Facility Types)			
Open Plan Office		X	X
Closed Private Offices	X	X	
Corridors	X	X	
Conference Rooms	X	X	
AIRMENS DORMITORIES			
Sleeping Rooms	X	X	
Public Areas (Lobbies, Lounges, TV Rooms, etc.)		X	X
Offices	X		
BACHELOR OFFICER QUARTERS			
Sleeping Rooms	X		
Combination Living/Sleeping Rooms	X	X	
Public Areas (Lobbies, Lounges, TV Rooms, etc.)		X	X
Dining Facilities		X	X
Offices	X		

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TABLE I (CONT'D)

CARPET WEAR CLASSIFICATION BY FACILITY TYPE

FACILITY	CARPET WEAR CLASSIFICATION		
	MODERATE	HEAVY	SEVERE
BANKS/CREDIT UNIONS			
Entrance and Customer Banking Space		X	X
Open Officer Office Space		X	
Offices	X	X	
BOWLING ALLEYS			
Concourse (excluding Food Service, Working and Storage Areas)		X	X
CHAPELS AND OTHER RELIGIOUS FACILITIES			
Worship Areas	X		
Educational Wing	X	X	
CHILD CARE CENTERS			X
CLUBS - OFFICER, CPO, NCO, EM, AND SERVICE		X	X
ENLISTED DINING FACILITIES (excluding Work Spaces and Serving Areas)			
Dining Areas		X	X

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TABLE I (CONT'D)

CARPET WEAR CLASSIFICATION BY FACILITY TYPE

FACILITY	CARPET WEAR CLASSIFICATION		
	MODERATE	HEAVY	SEVERE
EXCHANGE FACILITIES			
Sales Areas		X	X
Offices	X	X	
Resturant and Cafeteria Dining Areas		X	X
GOLF COURSE CLUBHOUSE			
Pro Shop/Administrative Space		X	X
Dining Area		X	X
LIBRARIES	X	X	
MEDICAL FACILITIES (excluding Patient Examination and Treatment Areas)			
Administrative Offices and Staff Support Areas	X	X	
Corridors in Administrative and Clinical Areas		X	X
Entrance Lobbies, Elevator Lobbies and Connecting Corridors			X
Clinical Waiting Areas		X	X

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TABLE I (CONT'D)

CARPET WEAR CLASSIFICATION BY FACILITY TYPE

FACILITY	CARPET WEAR CLASSIFICATION		
	MODERATE	HEAVY	SEVERE
MEDICAL FACILITIES (excluding Patient Examination and Treatment Areas)			
Day Rooms and Lounges		X	
Dining Areas	X	X	
Chapels	X		
Libraries	X		
Physicians' and Dentists' Offices (exlcuding Examination and Treatment Rooms, and Operatories)		X	X
Staff Sleeping and Watch Areas	X		
Classrooms	X		
Consultation Rooms	X		
Coronary Care Areas		X	X
Nursing Unit Corridors and Nursing Stations		X	X
Group Therapy and Meeting Rooms In Psychiatric Care Areas	X	X	
MUSIC AND/OR DRAMA CENTERS			X X

RESEARCH FACILITIES

Bio-Optic Laboratories	X		
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THEATERS	X	X	
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TABLE I (CONT'D)

CARPET WEAR CLASSIFICATION BY FACILITY TYPE

FACILITY	CARPET WEAR CLASSIFICATION		
	MODERATE	HEAVY	SEVERE
TEMPORARY LODGING FACILITIES, COMBINATION LIVING/SLEEPING ROOMS (excluding Kitchen and Dining Areas)	X	X	
TRAINING BUILDINGS/EDUCATIONAL FACILITIES (Including Dependents' Schools)			
Staff Offices	X		
Classrooms		X	X
Corridors	X	X	
YOUTH CENTERS		X	X

NOTE 1 - Wear level classification is assigned based on overall evaluation of the potential number of users, type of traffic, required appearance levels, anticipated frequency and intensity of use, and similar factors. Multiple classifications are assigned where significant differences among similar facilities/areas are particularly likely.

NOTE 2 - The listing of a facility type, or areas thereof, is not intended to indicate that carpet tile is necessarily the most appropriate floor covering for all such facilities/areas. Selection of the most appropriate floor covering shall be the product of an evaluation of the requirements of each individual project.

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NOTE 3 - Where carpet tile is to be specified, the lowest wear level classification shown shall determine the minimum carpet tile quality permissible for a given facility/area. Higher wear classifications than the minimum shown shall be used where indicated by a potential usage conditions. In doubtful cases, and where a single quality of carpet tile is desired for contiguous areas requiring different wear classifications, the highest applicable classification shall be used.

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TABLE II

MINIMUM YARN WEIGHT AND DENSITY

PILE FIBER	ACRYLIC/NYLON		ACRYLIC/ MODACRYLIC		NYLON FILAMENT		NYLON STAPLE	
	STAPLE		STAPLE		STAPLE		STAPLE	
YARN WEIGHT & DENSITY MINIMUMS	Oz./ Sq. Yd.		Oz./ Sq. Yd.		Oz./ Sq. Yd.		Oz./ Sq. Yd.	

WEAR LEVEL
AND SURFACE TEXTURE

Wear Level - Moderate

a. Level Loop	35 - 5000	20 - 3200	NR
b. Plush-Cut Pile	34 - 3400	20 - 3200	20 - 3200

Wear Level - Heavy

a. Level Loop	X	24 - 4000	NR
b. Plush-Cut Pile	X	28 - 3200	28 - 3200

Wear Level - Severe

a. Level Loop	NR	26 - 5000	NR
b. Plush-Cut Pile	NR	28 - 3800	28 - 4200

Moderate Traffic]

Heavy Traffic] - See Table 1 for wear classification by facility type
Severe Traffic] and area.

NR - Not recommended for use in this type wear area.

X - No weight minimum could be established due to absence of style in these areas.

Pile Density Formula: (See paragraph entitled, Pile Density.)

$(D) = \text{Density} = (36) \frac{(W)}{(T)}$, where

(W) = Average pile weight in oz. per sq. yd., and

(T) = Average pile thickness in inches.

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SECTION 09690

CARPET TILE

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CARPET TILE

1.1 Federal Standards (Fed. Std.):

No. 501A Floor Coverings, Resilient, Nontextile
& Ch Notice 1 Sampling and Testings.

Test Method 16E-1987 Colorfastness to Light: Water-cooled
Xenon-Arc Lamp Continuous Light

Test Method 134-1986 Electrostatic Propensity of Carpet.

D 1335-67 (R 1972) Tuft Bind of Pile Floor Coverings.

E 84-84a Surface Burning Characteristics of Building Materials.

56A-1978 Inhalation Anesthetics (Flammable and

Non-Flammable).

2. CONTRACTOR EXPERIENCE: Installation shall be done only by a specialty contractor normally engaged in this work, and having done satisfactory work of this type for a minimum of five years. The work shall be done by qualified,

experienced installers, working under a qualified supervisor. The supervisor shall have a minimum of five years experience in this area of work.

3. SUBMITTALS: Submittals shall be in accordance with the SPECIAL CLAUSES.

3.1 Shop Drawings: Provide, for approval, installation shop drawings showing:

- a. Area to be carpeted.
- b. Moldings and edge strips and locations thereof.
- c. Details of special treatments such as ducts and trench headers, and locations thereof.

3.2 Certified Laboratory Test Reports: Before delivery of carpet tile, submit certified copies of the reports of tests specified herein for flammability and static propensity for approval.

3.3 Certificates of Conformance or Compliance: Before delivery of carpet tile, submit copies of certificates from the manufacturer attesting that the carpet tile meets the requirements specified and that the carpet tile contractor and installation supervisor have the required experience for approval.

3.4 Installation Instructions: Before installations, submit the carpet tile manufacturer's printed instructions for installation. Provide complete procedures for an expert installation including preparation of substrate.

3.5 Maintenance Manual: Submit copies of the carpet tile manufacturer's manual for maintenance to the Contracting Officer. Include recommended type of cleaning equipment and materials, spotting and cleaning methods, and cleaning cycles.

3.6 Samples: Submit the following for approval:

- a. Two 18-inch by 18-inch minimum size samples of each carpet tile proposed for use, in the quality, pattern, and color specified.
- b. Two 12-inch long minimum pieces of vinyl or aluminum moldings.

4. DELIVERY AND STORAGE: Deliver carpet tile to the site in manufacturer's original wrappings and packages clearly labeled with the manufacturer's name, brand name, size, and related information. Register number shall be attached or stenciled on the carton. Store in a safe, dry, clean, and well ventilated area, protected from damage, soiling, and moisture. Do not open containers

until needed for installation unless verification inspection is required.

5. MATERIALS: Materials shall conform to the respective specifications and to the other requirements specified herein.

5.1 Carpet Tile:

5.1.1 Physical Requirements: Carpet tile shall be of tufted, woven, or fusion bonded construction with a secondary hardback of vinyl or prereacted polyurethane. Carpet tile shall be first quality, free of visual blemishes, streaks, poorly dyed areas, and other physical and manufacturing defects. Carpet tile shall be of the modular type, identical in size, 18 inches by 18 inches, 19 11/16 by 19 11/16, [by ,] plus or minus 1/64 inch, precision die cut for complete interchangeability. Sides shall be straight and corners square. Tufts shall be as firmly secured at the edges as in the other areas of the carpet tile. Carpet tile shall lay flat on a flat surface without curling, warping, buckling, cupping or doming and without any lumpiness, unevenness, or differences in thickness in individual tiles or from tile-to-tile. The carpet tile shall not stretch or shift position in use when installed in accordance with the carpet tile manufacturer's instructions. Carpet tile materials and treatments shall be nontoxic when used as ordinarily intended, reasonably nonallergenic, and free from other recognized health hazards. Carpet tile shall conform to the following:

Surface Texture:

Pile Fiber:

Pile Weight:

Pile Density:

Pattern and Color:

[as indicated on drawings.]

[match the sample on display
at .]

5.1.1.1 Surface Texture:

5.1.1.1.1 Loop Pile: Either single level uncut pile, or textured uncut pile, to provide an overall nondirectional surface. Maximum finished pile height differential between high and low pile loops of textured pile shall be 0.125 inch.

5.1.1.1.2 Plush-Cut Pile: Level cut pile fabrics.

5.1.1.2 Pile Yarn:

5.1.1.2.1 General: Fibers for yarn shall not have been reclaimed from any woven, tufted, knitted, or felted products. There shall be no undrawn fiber in spun yarn. Spun yarn shall be at least two ply for loop pile carpet tile. Yarn setting shall be sufficient to assure permanent texture retention under normal use conditions, cleaning, and shampooing. All yarns used in cut pile construction shall be heat set by the autoclave process. Fiber denier and staple lengths shall be subject to normal manufacturing tolerances with the following limitations: (a) acceptable tolerance in staple length not more than 10 percent; (b) acceptable denier variance plus or minus 10 percent in individual filament denier and plus or minus 3 percent in average denier.

5.1.1.2.2 Blends: Not more than two fibers listed below, and not less than 15 percent of either fiber. Treat acrylic and modacrylic fibers blended together as a single fiber type. The major component of a blend shall be the governing fiber in construction interpretation, except for weight. For example, treat a construction of 70 percent acrylic and 30 percent nylon as acrylic. Not more than 3 percent metallic filaments or other materials may be added to blends to reduce static propensity.

5.1.1.2.3 Twist and Twist Multiplier: ASTM D 1443; the minimum twist multiplier for singles shall be 2.75; minimum twist for a 2-ply yarn shall be 80 percent of the twist in the singles yarns; for a 3-ply yarn, 70 percent; and for a 4-ply yarn, 60 percent.

5.1.1.2.4 Staple Nylon: Carpet-type fiber with average fiber size of 15 denier or coarser and minimum staple length of 6 inches.

5.1.1.2.5 Continuous Filament Nylon: not less than second generation, continuous high bulk or textured carpet-type fiber modified to provide increased translucence or opacity for soil hiding with average filament size of 15 denier or coarser.

5.1.1.2.6 Staple Acrylic: Carpet-type fiber with an average fiber size of 15 denier or coarser and minimum staple length of 3-1/2 inches for woolen system yarns and 6 inches for parallel (modified worsted) system yarns.

5.1.1.2.7 Staple Modacrylic: Carpet-type fiber with an average fiber size of 15 denier or coarser and minimum staple length of 3-1/2 inches for woolen system yarns and 6 inches for parallel (modified worsted) system yarns.

5.1.1.2.8 Extractable Matter in Finished Yarn: ASTM D 2257; not more than two percent, extracted using a single solvent as follows:

Nylon - Halogenated hydrocarbon or cyclohexane

Acrylic - Chloroform or ether

Modacrylic - Ether

5.1.1.3 Primary Carpet Backing: Those customarily used and accepted by the trade for each type of carpet tile. The back coating compound shall be a synthetic resin or natural or synthetic latex compound. The back coating quantity shall be that normally used in the suppliers product.

5.1.1.4 Secondary Hardback: Hardback for fusion bonded carpet tile shall be fiberglass reinforced vinyl. Hardback for woven or tufted carpet tile shall be pre-reacted polyurethane or fiberglass reinforced vinyl.

5.1.1.4.1 Vinyl Hardback: A suitably compounded virgin polymer or copolymer of vinyl chloride resin, plasticized with compatible, primary plasticizers only. Virgin polymer shall be defined as a polymer or copolymer that has not been processed into a finished product prior to use in the cushioning. Primary plasticizers shall be defined as plasticizers which are individually and totally compatible with the polymers or copolymers of vinyl chloride resin. The compound shall be uniform and free from objectionable odor. The vinyl shall conform to the following:

- a. Hardback shall average not less than 0.115 inch in thickness.
- b. The weight shall average not less than 125 oz. per sq. yd.
- c. The compression resistance shall be not less than 100 pounds per square inch.
- d. Adherence - no separation of the carpet tile and cushion.
- e. Accelerated weathering - shall not crack, become stiffer and brittle or soft and tacky, and shall not change color appreciably when compared to the unexposed sample after 100 hours in the weatherometer.
- f. Flexibility at 70 degrees F and 30 degrees F - shall not crack, flake, craze, or show any other indication of failure.
- g. Hardback shall have a maximum one percent moisture absorbency after four hours submersion in water at 72 degrees F.
- h. The volatile matter shall not exceed one percent.

5.1.1.4.2 Pre-reacted Polyurethane Hardback: The polyurethane shall be a fully pre-reacted thermosetting elastomer made entirely from virgin material and shall conform to the following:

- a. Hardback shall average not less than 3/32 inch in thickness.

- b. The weight shall be not less than 45 oz. per sq. yd.
- c. Adherence - no separation of the carpet tile and cushions.

- d. Accelerated weathering - shall not crack, become stiffer or brittle or soft and tacky, and shall not change color appreciably when compared to the unexposed sample after 100 hours in the weatherometer.
- e. Flexibility at 70 degrees F and 30 degrees F - shall not crack, flake, craze, or show any other condition of failure.
- f. Volatile matter shall not exceed one percent.
- g. Hardback shall have a maximum one percent moisture absorbency after four hours submersion in water at 72 degrees F.

5.1.2 Performance Requirements:

5.1.2.1 Shrinkage: The maximum immersion shrinkage in warp and filling directions shall be 0.015 inch for vinyl hardback carpet tile and 0.05 inch for pre-reacted polyurethane hardback carpet tile. The maximum air temperature shrinkage in warp and filling directions shall be 0.015 inch for vinyl hardback carpet tile and 0.2 percent for pre-reacted polyurethane carpet tile. Test in accordance with paragraph entitled, Shrinkage, Immersion, and paragraph entitled, Shrinkage, Air Temperature.

5.1.2.1.1 Shrinkage, Immersion: Condition a sample of the specified carpet tile under standard conditions as defined in Fed. Std. No.191 for a period of 24 hours. Then mark and measure the specimen at three different locations in the length and width directions; each distance shall be 18 inches, with distances marked to within about 2 inches from the edges of the carpet tile, immerse sample in 110 degrees F water for about 15 minutes; mix 2 grams of sodium alkyl sulfate type of detergent with 50 grams of water at 110 degrees F and apply to pile surface of carpet tile. Scrub sample with a soft bristle brush by stroking back and forth 20 times (10 times in each unilateral direction), and in both length and width directions; rinse well to remove majority of detergent; squeeze and dry at 125 degrees F until bone dry; again condition under standard conditions for 24 hours.

5.1.2.1.2 Shrinkage, Air Temperature: Condition a sample of the specified carpet tile under standard conditions as defined in Fed. Std. No. 191 for a period of 24 hours. Mark the specimen as specified in paragraph entitled, SHRINKAGE, IMMERSION. Place sample on a flat surface in a room or oven at 95 degrees F, plus or minus 5 degrees for a period of 24 hours and measure for shrinkage.

5.1.2.1.3 Shrinkage, Evaluation: Measure the specimen and compute the shrinkage using the following formula:

$$\text{Shrinkage} = \frac{A-B}{A} \times 100$$

Where:

A = Average of initial measurement

B = Average measurements after shampooing

Report the shrinkage in both the warp and filling directions to the nearest 0.1 percent.

5.1.2.2 Adherence:

5.1.2.2.1 Vinyl Hardback: Subject a specimen of the finished carpet tile with vinyl hardback attached to accelerated aging by exposure in a circulating air oven for 96 hours at a temperature of 90 degrees F plus or minus 2 degrees. Remove the sample from the oven and allow it to cool to room temperature, grasp the base carpet with the fingers of one hand and the thickness of the hardback with the fingers of the other hand and pull firmly in opposite directions. There shall be no tearing of the hardback nor separation of the carpet and hardback.

5.1.2.2.2 Pre-reacted Polyurethane Hardback: Use a finished carpet tile with an attached polyurethane hardback, grasp the base carpet with the fingers of one hand and the thickness of the polyurethane hardback with the fingers of the other hand and pull firmly in opposite directions. There shall be no tearing of the hardback nor separation of the carpet and hardback.

5.1.2.3 Flexibility: Vinyl hardback and pre-reacted polyurethane shall not crack, flake, craze, or show any other indications of failure when tested as specified below.

5.1.2.3.1 At 70 Degrees F: Use a 4-inch by 4-inch cushioning specimen. Double the specimen and press flat on itself in any direction. Hold doubled for five minutes. Examine for indications of failure while doubled and after pressed flat. Make the examination visually at a distance of one-foot.

5.1.2.3.2 At 30 Degrees F: Fed. Std. No. 501, Method 6511 using one inch mandrel plus or minus 1/8 inch.

5.1.2.4 Color fastness to Light: AATCC 16E; use the Xenon arc as the light source. Consider colors that are deeper or equivalent in hue to Row 2 of the AATCC Color Transference Chart as dark colors; consider those lighter as light colors. Colors for synthetic yarns shall show a gray scale rating of at least 4 for light shades after the equivalent of two L-4 breaks and at least 4 for dark shades after the equivalent of at least three L-4 breaks. Woolen

yarns shall show a gray scale rating of at least 4 for light shades after the equivalent of one L-4 break and at least 4 for dark shades after the equivalent of two L-4 breaks. Base classification on the AATCC Blue Wool Lightfastness Standards L-2 to L-9. Test all colors specified. If the Xenon Arc Fadeometer has a built-in continuous monitor and control device made by the manufacturer, then the blue wool standards referenced in AATCC 16E need not be used to judge the L-4 breaks, providing the manufacturer's instructions are followed.

5.1.2.5 Dry and Wet Crocking: AATCC 8; all colors specified shall show a minimum rating of step 4 on the AATCC Color Transference Chart.

5.1.2.6 Pile Coverage: Sufficient to conceal backing.

5.1.2.7 Tuft Bind: ASTM D 1335; the minimum tuft bind in average pounds-force for loop pile shall be 15 pounds and for cut pile 10 pounds.

5.1.2.8 Flammability: The carpet tile shall have a flame spread rating of 75 or less when tested in accordance with ASTM E 84.

5.1.2.9 Static Control: AATCC 134; incorporate a permanent static control system to control static build-up to less than [3.5] [1.5] kV. Test at 20 percent relative humidity at 70 degrees F.

5.1.2.10 Electrical Resistance: NFPA 56A, Section 4628; maximum electrical resistance for carpet tile shall be 20,000 megaohms measured between the floor surface and building or applicable ground material, and shall provide a resistance of not less than 150 kilohms when measured from any point on the floor.

5.1.3 Calculation of Physical Requirements:

5.1.3.1 Pile Weight: Determine the average pile weight in oz. per sq. yd. in accordance with ASTM D 418, except that pile weight of unsheared carpet tile may be determined by dissecting specimens taken from unfinished carpet tile before a back coating is applied. Unsheared carpet tile includes those which are tip sheared or defuzzed in a shearing operation where loss of fiber is practically nil. Determination by dissecting specimens is only valid to the extent that it completely represents the pile weight of the fully finished carpet tile. In determining pile weights, make no allowance for the inclusion of any fibers needled or flocked onto or into the primary backing prior to tufting or weaving, or to any such process which is designed primarily to increase the total yarn weight and which is not integrally a part of the knitting, weaving, or tufting manufacturing process. In the event of variance in results between ASTM D 418 and the dissection method, the former prevails.

5.1.3.2 Percent of Fibers in Blend: Determine the average percent of fibers in a blend in accordance with AATCC 20.

5.1.3.3 Pile Weight of Blend: Determine the pile weight of a blend by multiplying the average percent of each fiber by pile weight and totaling the result. For example, the weight of a blend of 30 percent nylon and 70 percent acrylic with yarn weights of 24 and 35 oz. per sq. yd. respectively, would be calculated as follows:

Nylon	$0.30 \times 24 = 7.2$ oz. per sq. yd.
Acrylic	$0.70 \times 35 = 24.5$ oz. per sq. yd.
Total wt	31.7 oz. per sq. yd.

5.1.3.4 Pile Thickness: Determine the average pile thickness of the carpet tile in accordance with ASTM D 418. Make measurements to the nearest 0.01 inch instead of 0.10 inch as stated in ASTM D418.

5.1.3.5 Pile Density: Calculate the average density as follows:

(D) = Density = (36) (W), where

(T)

(W) = Average pile weight in oz. per sq. yd., and

(T) = Average pile thickness in inches.

5.2 Molding: [A hammered surface aluminum, pinless clamp down type designed for the type of carpet tile being installed. Finish shall be color anodized aluminum. Floor flange shall be a minimum 1-1/2 inches wide, face shall be a minimum 5/8 inch wide.] [Heavy-duty vinyl designed for the type of carpet tile being installed. Floor flange shall be minimum 2 inches wide. Color shall be .]

6. INSTALLATION:

6.1 General: Install carpet tile in accordance with the manufacturer's printed instructions after the work of other trades, including painting, is substantially done. Installed carpet tile shall be smooth, uniform, and secure. Install tile [with carpet pile laying in same direction] [in design as indicated on drawings] []. Fit cut outs, such as door jambs, columns, and ducts, neatly and securely.

6.2 Carpet Tile Location: Install carpet tile wall-to-wall in rooms and areas [indicated on drawings]. [specified herein.] Include all material indicated, specified, or necessary for a complete finished installation.

Contractor shall be responsible for the required quantities of carpet tile and shall carefully check all dimensions in the field as well as other conditions affecting the work.

[Room or Area	Carpet Tile
]

6.3 Extra Carpet Tile: Contractor shall provide [one carton of 20 carpet tiles] [cartons of 20 carpet tiles] in addition to the quantity required for installation. The extra carpet tile, for replacement use, shall be of same manufacture, type, and quality as the installed carpet tile.

6.4 Substrate Preparation: Inspect all rooms and areas to be carpeted. Before installation, test concrete floors for moisture content and take corrective measures if necessary. Repair holes, cracks, depressions, or rough areas using material recommended by the carpet tile manufacturer. Grind raised areas or ridges smooth and to a level surface. Floor shall be free of any foreign materials and swept broom clean. Minimum floor temperature before, during, and after installation and requirements for conditioning adhesive, when used, shall comply with the carpet tile and adhesive manufacturers' instructions. However, in no case shall floor temperature be less than 60 degrees F for 24 hours prior to, during, and after installation. Do not permit traffic or movement of furniture or equipment in carpeted areas for at least 24 hours after installation. Carpet tile installation shall constitute validation by the Contractor that the substrate and conditions in the area meet all requirements for satisfactory installation.

6.5 Accessibility: Carpet tile installation shall be such that the tiles are easily removable to provide access to the substrate or subfloor area, and that such exposed area shall be capable of being restored to its original condition by the replacement of the removed tile or installation of new tile of the same manufacture, type, and quality.

6.6 Carpet Molding: Finish carpet tile edges meeting hard surface flooring with moldings. Install in accordance with manufacturer's instructions.

7. CLEANING AND PROTECTION:

7.1 Cleaning: After installation, remove all debris, metal edging, scraps, and other foreign matter. Remove any soiled spots or adhesive from the face of the carpet tile with the appropriate spot remover. Remove any protruding face yarn with sharp scissors. Vacuum the carpet tile clean.

7.2 Protection: Carefully protect installed carpet tile from soiling and damage by heavy, reinforced, nonstaining kraft building paper or polyethylene film of an approved quality and thickness. Lap and secure edges of covering widths. Keep covering in repair and replace damaged portions. Protective covering shall be removed or left in place as directed by the Contracting Officer.

8. CONSTRUCTION QUALITY CONTROL: Attention is directed to SECTION: CONSTRUCTION QUALITY CONTROL which requires the Contractor to perform quality control inspection, testing, and reporting.

* * * * *

- REMINDER -

Located at the front of these specifications are the Contract Clauses, Special Clauses and Division I GENERAL REQUIREMENTS of the Technical Specifications, which apply to every aspect of this contract including the work in this section whether performed by Prime Contractor, subcontractor, or supplier.